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ABSTRACT

Often funding agencies and donor governments face the question of whether should they support information and communication (ICT) technologies activities in their development projects. Should the money be invested in computers and communication devices or will it be better spent on food, shelter, health, and education? The choice need not be "either or." If used intelligently and innovatively, ICTs can form an integral component of development projects, as is shown by the award-winning Information Village project of the M. S. Swaminathan Research Foundation. The important point to remember is that one does not have to use technology because it is there, but one uses it if there is a genuine advantage. In any development program, people and their contexts should decide how one goes about implementing development interventions. The needs of the people and the best means to satisfy them should determine the whole program. Often ICT-based development projects do not bring in the expected results because of undue emphasis placed on technology. Against this background, the factors that led to the success of the Pondicherry experience are analyzed. Includes 15 illustrations.) (Contains 9 references.) (Author)

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Reaching the unreached: How can we use ICTs to empower the rural poor in the developing world through enhanced access to relevant information?

Subbiah Arunachalam*
M S Swaminathan Research Foundation
Chennai, India
E-mail: arun@mssrf.res.in

U.S. DEPARTMENT OF EDUCATION
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Abstract:

Often funding agencies and donor governments face the question should they support ICT activities in their development projects. Should the money be invested in computers and communication devices or will it be better spent on food, shelter, health, and education? The choice need not be 'either or'. If used intelligently and innovatively, ICTs can form an integral component of development projects, as is shown by the award-winning Information Village project of M S Swaminathan Research Foundation. The important point to remember is that one does not have to use technology because it is there, but one uses it if there is a genuine advantage. In any development programme, people and their contexts should decide how one goes about implementing development interventions. The needs of the people and the best means to satisfy them should determine the whole programme. Often ICT-based development projects do not bring in the expected results because of undue emphasis placed on technology. Against this background, the factors that led to the success of the Pondicherry experience are analysed.

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Some people from the community in Pondicherry MSSRF works with

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**The author is a member of the International Advisory Board of IICD, an Honorary Fellow of the Chartered Institute of Library and Information Professionals, UK, an Honorary Member of the American Society for Information Science and Technology, a life member of IASLIC, and a member of both the Indian and the International Science Writers Associations. He is on the editorial boards of Current Contents, Scientometrics, Journal of Information Science, and Current Science.*

Introduction

The widespread availability and convergence of information and communication technologies - computers, digital networks, telecommunication, television, etc. - have led to unprecedented capacity for dissemination of knowledge and information. The impact of this fourth information revolution is felt in education, research, medicine, government, business and entertainment in many parts of the world. But as Anton Mangstl[1] points out, the benefits have reached only about 5% of the world's population. The new ICTs have in fact led to a digital divide not only between rich and poor nations but also within nations. Even in affluent United States of America, as Rev. Jesse Jackson has pointed out ICTs have not only widened the digital divide but also deepened the racial ravine, and the relative disadvantage suffered by inner city populations (mostly Blacks and Hispanics) is continually on the rise. History has shown that technology by itself is a great divider. It exacerbates the inequalities in society. Is there then no way for the poor and the downtrodden to benefit from ICTs?

"Groups as diverse as the United nations, the G8 nations, Foundations, national, state and local governments, and private companies have seized upon the hope that the use of ICTs could enable even the poorest of developing nations to 'leapfrog' traditional problems of development like poverty, illiteracy, disease, unemployment, hunger, corruption, social inequalities so as to move rapidly into the modern Information Age," says Kenneth Keniston,[2] Director of the MIT-India programme. Mark Malloch Brown,[3] Administrator of UNDP, is convinced that "ICT can help us reach the targets established by world leaders at September's Millennium Summit, including the goal of halving poverty by 2015." Are these hopes over optimistic?

In July 2001, I was invited by Hivos, the Dutch development oganization, to a workshop on ICTs and development held at Museum Naturalis, Leiden, and to another workshop at IICD, The Hague, on a similar topic. I met a number of the country's important development researchers and enthusiasts and many of them told me that Ms Eveline Herfkens, Dutch Minister for Development Cooperation, was keen to invest on development activities in the least developed countries of the world, but was a bit skeptical about investing on ICT-related activities. They wondered if some of us from the developing world, especially those who are working with ICTs, could convincingly argue the need for supporting ICT-based development initiatives. Incidentally, Ms Herfkens is not alone. There are many others who have genuine doubts about the advisability of funding ICT-based development projects. As pointed out by Mark Malloch Brown,[3] "in both developed and developing countries there is still considerable skepticism as to whether providing access to information and communication technology can play a significant role in reducing poverty." The skeptics draw support from many not-so-well conceived ICT

projects in developing countries, many of them in the hands of economists and technicians who fail to appreciate the social and cultural issues that are key to a communication strategy.[4]

I took part in both the workshops, both well attended and focused. Indeed at the Leiden workshop not only did I make a presentation of the well-known Pondicherry Information Village project but was also interviewed on stage by a leading Internet journalist. Inevitably, this question of the role of ICTs in development came up more than once and I reiterated my own and our Foundation's firm belief that as long as programmes are people-centred and as long as technology can make a distinct difference ICTs are important and deserved to be supported. Experts like Monkombu Swaminathan and Bruce Alberts believe that with intelligent intervention, we can make ICTs an ally in the equity movement and that if ICTs can benefit the rich there is no reason why we should not work towards reaching the benefits of ICTs to the poor. Indeed Swaminathan believes that ICTs can be used very effectively in our effort to include the excluded and reaching the unreached and Prof. Alberts keeps quoting the example of the Information Village Project in Pondicherry as a model for others to follow.

Information for development: The Pondicherry experience

What has been achieved by the Information Village project of the M S Swaminathan Research Foundation? Let me intersperse my own description of the project with the comments of three eminent people – a journalist, a Nobel-class scientist and a development communication specialist. Let me begin with a couple of quotes from an article entitled "Connecting rural India to the world" by Celia Dugger in *The New York Times* dated 28 May 2000.

> "Embalam - In this village, the century-old temple has two doors. Through one lies tradition. People from the lowest castes and menstruating women cannot pass its threshold. Inside, the devout perform daily pujas, offering prayers. Through the second door lies the Information Age, and anyone may enter. In a rare social experiment, the village elders have allowed one side of the temple to house two solar-powered computers that give this poor village a wealth of data, from the price of rice to the day's most auspicious hours."

The door to modernity and the door to tradition at Embalam temple

Here 'anyone' includes the Dalits, people of the lowest castes, who were referred to as 'untouchables' in pre-Independent India. Caste-based division is still a problem in southern India despite strict laws being in force, and our knowledge centre at Embalam has made a minor dent. A new knowledge centre in Thirukanchipet, a village of Dalits, has led to another minor social revolution. These villagers used to get their tea served in cups reserved for them in the tea stall in the neighbouring village Thirukanchi; the upper caste men would use a different set of cups. After the Dalit volunteers started working with computers and new technologies at the knowledge centre, they became a bit emboldened and started displaying on the notice board of the knowledge centre the poems of the Tamil revolutionary poet Subrahmanya Bharathi, who had played a key role in India winning Independence from British rule, which questioned caste-based divisions in society and reiterated that all men are equal. Within a few weeks the tea stall started serving them tea in the same cups used by the upper caste clients. Yet another example of including the excluded.

Celia Dugger's story in New York Times ran to half a page and that is probably the first time that NYT devoted so much space for a developmet story from a non-Western country. She continued:

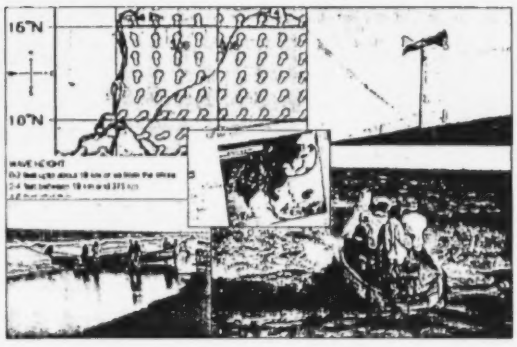
"Information from the computers in this area, where people live in thatched mud huts, has saved the life of a milk cow named Jayalakshmi, prevented the blindness of an old woman named M. Minakshi and routinely warned fishermen of stormy weather that can claim lives. Some months back, Subrayan Panjaili, a round-faced woman who cannot read or write, sat in the courtyard of her small home in the village of Kizhur, in Pondicherry, with the family's only milk cow, Jayalakshmi. For five days and nights, the cow moaned while in labor. Something had gone wrong and she was unable to deliver her calf. Mrs. Panjaili grew ever more fearful that the cow would die. "This is the only good income we have," she said, explaining that the four gallons of milk the cow produced each day paid the bills. Word of Mrs. Panjaili's woebegone cow soon spread to Govindaswami, a public-spirited farmer. The village's computer, obtained through the Swaminathan Foundation, is in the anteroom of his home. The computer is operated full time and for no pay by his 23-year-old, college-educated daughter, Ezhilarasi, who used it to call up a list of area veterinarians. One doctor arrived that night and, by the light of a bare electric bulb, stuck his arm into Jayalakshmi, pulled out the calf's spindly leg and tied a rope to it, then dragged the calf into the world."

Ms Minakshi was sent to Aravind Eye Hospital in Madurai , about 200 km away, and she got her cataract removed.

In an experiment in electronic knowledge delivery to the poor, we have set up knowledge centers in ten villages near Pondicherry in southern India and have connected them by a hybrid wired and wireless network -- consisting of PCs, telephones, VHF duplex radio devices, spread spectrum and email connectivity through dial-up telephone lines -- that facilitates both voice and data transfer, and have enabled the villagers to get information they need and can use to improve their lot. All the knowledge centers are open to all, irrespective of age, sex, religion, caste, and level of literacy and education. The entire project draws its sustenance from the holistic philosophy of Swaminathan, which emphasizes integrated pro-poor, pro-women, pro-Nature orientation to development and community ownership of technological tools against personal or family ownership, and encourages collective action for spread of information and technology. The bottom up exercise involves local volunteers to gather information, feed it into an intranet-type network and provide access through nodes in different villages. The ten villages are connected in a hub and spokes model, with Villianur, a small town 13 km west of Pondicherry, serving as the hub and value addition center. Value addition to the raw information, use of the local language (Tamil) and multimedia (to facilitate illiterate users), and participation by local people right from the beginning are the noteworthy features of the project. Most of the operators and volunteers providing primary information are women, thus giving them status and influence. All centres came up because of demands made by the community. Apart from these villages, the project had established knowledge centers in three more villages but had withdrawn because either these centers did not share information with all people in the village, or did not maintain regular hours and did not maintain the equipment well.

VHF two-way radio, Internet, Spread spectrum antenna and solar panels at Villianur

In the villages where the project operates, we have shown that access to timely and relevant information does make a difference to the life of the rural poor. We have also shown that new ICTs can play a role in this effort. For example, the Value Addition Centre at Villianur delivers daily images obtained from a web site run by the US Navy of the predicted wave conditions in the Bay of Bengal to the centers at Veerampattinam and Nallavadu. The villagers there are fisherfolk, and the sea conditions are of crucial interest for their safety. The information is so critical that the voice report from Villianur is transmitted at the coastal villages over a public address system to the fishermen as they prepare their boats in the early morning. "It saves lives", said one respondent when asked about its usefulness. Information provided in the village knowledge centres is locale specific and relates to prices of agricultural inputs (such as seeds, fertilizers, pesticides) and outputs (rice, vegetables, sugarcane), market, entitlement (the multitude of schemes of the Pondicherry government), health care (availability of doctors and paramedics in nearby hospitals, women's diseases), cattle diseases, transport (road conditions, cancellation of bus trips), weather (appropriate time for sowing, areas of abundant fish catch, wave heights in the sea), etc. Unique to our project is the fact that most information is collected and fed in by volunteers from the local community itself. The centres are operated by local volunteers, mostly women.



Wave height data from a US Navy website brought to fishermen of Veerampattinam

The seeds of a virtual university

Prof. Bruce Alberts,[5] President of the National Academy of Sciences, USA, who had visited the project villages twice, has this to say:

"I examined an imaginative set of experiments in electronic knowledge delivery designed by our foreign associate, M.S. Swaminathan, ... connecting scientists to each other is only the first step. Scientists everywhere must use these initial connections as a tool for spreading their knowledge, skills, and values throughout their own nations, including their local communities. By taking full advantage of new information technologies, the scientific community has an unprecedented opportunity to close the vast "knowledge gap" between all peoples. How might this be possible? ... ... I want to highlight a wonderful example that points the way forward. As mentioned previously, the M.S. Swaminathan Foundation has established an experimental network in India that will soon connect more than 20 isolated rural villages to a wireless Internet service. About half of the population in most of these villages has a total family income of less than $25 per month. The project is designed to provide knowledge on demand to meet local needs

Prof. Bruce Alberts addressing the people of Embalam

using the World Wide Web, and it does so through a bottom-up process. The process starts with volunteer teams that help poll the villagers to find out what knowledge they want. Particularly popular thus far are women's health information, advice on growing local crops and protecting them from diseases, the daily market prices for these crops, local weather forecasts, and clear information about the bewildering array of programs that are provided by the government to aid poor families. To participate, each village must provide a public room for the computer system, as well as the salaries for a set of trained operators. In return, the village receives the needed hardware and maintenance for the communication system, specially designed Web sites in the local language that convey the requested information, and training programs for those villagers who have been selected to run their local knowledge system. ... ... I am enormously impressed with the quality of thought that has gone into this project, as well as by the energy, dedication, and skill of the young Indian scientists who are carrying it out."[5]

Addressing the UN-sponsored meeting on Science for African Development at Geneva in July 2001, Alberts[6] referred to the Pondicherry experience again:

"... in this village there is a computer room, connected by wireless Internet to a service center run by the M.S. Swaminathan Research Foundation. This "information village" project, and others like it, have successfully relied on women from the village itself to provide daily weather and market prices, as well as agricultural and health information, to all the inhabitants. ... ... As scientists, we need to study and learn from these experiments - so as to make a science out of connecting the world to knowledge resources. With the technology moving so fast, it is critical to "learn by doing" in this way, so that we learn how to make the next wave of the technology even more useful for productive and sustainable economic development."[6]

Indeed, Prof. Alberts sees in these knowledge centres the seeds of a virtual university connecting academia with the rural poor and a model for the United States to follow.

"I envision a global electronic network that connects scientists to people at all levels – farmers' organizations and village women, for example. The network will allow them to easily access the scientific and technical knowledge that they need to solve local problems and enhance the quality of their lives, as well as to communicate their own insights and needs back to scientists. ... ... My experience in India has made it clear to me that our nation would be much more successful in such endeavours if we were humble enough to incorporate the potential beneficiaries of a service into its initial planning."[5]

In his 138th Presidential address to the NAS, Prof. Alberts[7] spoke about his second visit to the the knowledge centres and the role of these centres in empowering women:

"In particular, the women had clearly been empowered, and they enthusiastically reported how their sudden access to information about crops, weather, market prices, and government programs had improved the life of the village."[7]

Can ICTs deliver by themselves?

Can we then solve the problem of poverty by providing access to computers and telecommunication to the poor of the world? Let us hear Alfonso Gumucio Dagron,[8,9] a leading

expert in development communication and the author of *Making Waves: Stories of Participatory Communication for Social Change*, a report to the Rockefeller Foundation, 2001:

"In the field of dreams of ICTs pushers the picture is rather simple: ICTs and Internet connectivity are per se the solution for poverty and underdevelopment. Actually, it is much more complex than that. This is not the first time we are confronted with the idea that technology is the panacea for development. Those who have been active in development during the past 30 years, as I had, know very well the previous wave of "diffusion of technology", by which the underdeveloped countries would magically join the industrialized world through the use of modern technology graciously provided by the international cooperation agencies. Worst of all, behind it, there was the assumption that "knowledge" was a privilege of industrialized nations, and our countries in the South just didn't have enough of it. Of course we know today (there is abundant literature about it) that it was not that coarse. It could only be that simple in the field of dreams of those who know little about Third World countries, but think they know what is best.

With the risk of repeating something that everyone already knows (or should know) I will remind ICTs pushers that when we talk about technology we are only referring to instruments, not to social, economic or cultural development. A knife is just a knife, it can be used to hurt someone or to carve a beautiful wood sculpture. Content and utilization is what makes the difference. Development priorities are to be analyzed - hopefully by the "beneficiaries" - before deciding which technology is appropriate, where and how. Even Bill Gates knows that it is not a matter of pushing computers to the developing countries; not long ago he acknowledged that basic health care services are by far a bigger priority than computers and internet connectivity. Those that think that poverty in our countries is just a matter of not having access to information and technology are showing much ignorance about social injustice, human exploitation and inequalities not only between countries, but also among social classes within each country. Information is not the magic cure for hunger.

This is not to say that we should discard these appealing gadgets of progress. On the contrary, we have to avoid the frustration of using them responsively, because if we do, it will only create more frustration among the people that are supposed to benefit from the new information and communication technologies. As long as the World Wide Web is 90% in English and 99% irrelevant to a peasant in Bolivia or a factory worker in Russia, we can't be over confident about the benefits of connectivity. Most reports on telecentres in Asia, Africa and Latin America acknowledge that people use the phone and the photocopier, and very little of the computer and internet facilities. And those that use it are generally the most educated, the well off in the community, not the originally intended and most in need beneficiaries.

There are too many examples of projects that are only bombarding the Third World with computers, in the most irresponsible manner and for the benefit only of hardware and software companies. On the other hand, there are very few, I insist, very few experiences of use of new information and communication technologies that are paradigmatic in the way they contribute to development.

In my book "Making Waves" I have picked a few representative examples that show how ICTs are being used in participatory development and how these instruments can be "appropriated" by the community when the project is well conceived. There is one thing that we can not separate from any ICTs project in Third World countries: the development of local databases and local web

Virtually all documentation is in Tamil

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pages that are relevant to the people and that take into account their daily needs, their culture and their language. If this is not embedded into a project, I doubt it will have any positive results for the community. *This is why the Village Knowledge Centers in Pondicherry (M.S. Swaminathan Research Foundation) are such an important and coherent experience*. The potential is also great for InfoDes in Cajamarca (Perú). The convergence between ICTs and other media is also exciting and promising. That is why I included the examples of Kothmale Radio in Sri Lanka, Púlsar in Latin America and the Local Radio Network in Indonesia.

Let's not forget that most of the ICT experiences at the grassroots level are only 4 or 5 years old. It is too soon to claim victory and too soon to discard them, but not too soon to question them and to make sure that they will be sustainable and for the benefit of communities after the external assistance withdraws. Communities should adapt technology to their needs and to their culture, not the opposite. As of today, the ICTs in our Third World countries are only "experiments with a potential". One thing is what is written in project reports, and another thing is what is really happening at the community level. Definitely, the tool is still to be shaped. I challenge ICTs pushers to go there and check."[8]

Alfonso Gumucio[9] warns us

"It is sad that many of our colleagues from Third World countries, especially those working in North America and Europe, have taken distance from the realities of our countries. They base many of their assumptions on institutional documents and "success" reports, without knowing reality."[9]

This view is echoed by Bruce Girard, the man behind Pulsar and many development programmes using radio innovatively. Indeed Girard points out (personal conversation, 4 April 2002) instances of projects, which have nothing more to show other than a well-written application sent by email, winning awards! I am afraid that there are too many desktop researchers and 'experts' in this field who have virtually no field experience but who go on churning out papers based on what they read and they are often invited to conferences and seminars on ICTs for development whose numbers are increasing out of proportion to what is actually being achieved in the field. If the energies and funds invested on these meetings were directed at real grassroot level work we would have had many more examples of successful projects and happier communities. And organizations established to achieve some of these goals do not seem to perform as well as they should. In his Presidential address to the Fellows of the US National Academy of Sciences, referred to earlier, Bruce Alberts[5] told, "I learned to my surprise that most of the international organizations established by the United Nations with the great hope of using science and technology to improve the human condition are seriously hampered by bureaucracy and a lack of energy, innovation, and resources."

The lessons learnt

What are the lessons we have learnt from our own project and the experience of others in the past few years? Is this model sustainable? To someone who has had the privilege of watching every step from close quarters, it is clear that technology by itself may not mean much and one needs to take care of the context, content and language. Let us list the factors that led to our success:

Children learning to draw on a PC at Veerampattinam

First and foremost, the visionary leader, his able technocrat implementor and his small team of half a dozen dedicated staff understood the people and their context and got accepted by them. The local communities have trust in us. People readily offered space to set up the knowledge centers – in panchayat (local level government) offices, in temples, in government-owned buildings, and in one village in a private individual's home! In two villages the people collected money to construct new buildings to house the knowledge centre. In some villages the communities pay the telephone bills and Internet charges.

Second, our relationship with the local community is not of the "donor-recipient" type but one of "partnership in progress". Right from the beginning the people of the villages were involved at every stage. Every month village volunteers and the Foundation's staff meet and review what has been accomplished and discuss new initiatives.

We understood the need to develop 'content' – the information needed to satisfy the communities' needs - and developed much of the content in collaboration with the local people. We have created close to a hundred databases, including rural yellow pages, which are updated as often as needed. Incidentally, the entitlements database, which serves as a single-window for the entire gamut of government programmes, has created so much awareness among the rural poor that there is greater transparency in government now. Farmers get the right price for their farm produce and wage-labourers get the right wages from their employers, thanks to the knowledge centers. We are not averse to borrowing 'content' from elsewhere if it is found useful to the local community. For example, we have collected much useful information from Government departments, the Tamil Nadu Agricultural University, Aravind Eye Hospital, and the US Navy's website. We have held a few health camps in the villages in cooperation with well-known hospitals as part of gathering information about local health care needs.

These landless labourers now get correct wages

Most of the transactions are in Tamil, the local language. Our village volunteers are trained to input material in Tamil using the standard QWERTY English keyboard. [We were indeed surprised at the speed with which the village volunteers learnt to use the computers and more so learnt to type Tamil, with its 247 characters, using the standard English language keyboard without using the template. Some of them have learnt to code in html and design web pages. As our chairman Prof. Swaminathan says, these villagers take to technology as fish to water. It is a question of getting the opportunity. We use multimedia and loud speakers to reach out to illiterate

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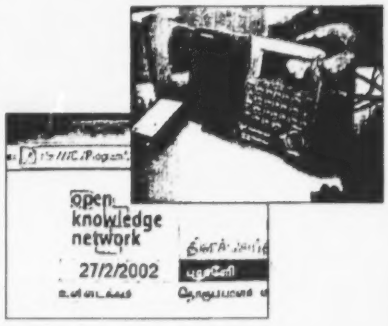
clients. We even have a fortnightly Tamil newspaper called *Namma Ooru Seithi* ('Our Village News'). The newspaper has become so popular that Government departments such as District Rural Development Agency, Social Welfare Board, Small Scale Industries Centre use our newspaper to publicize their schemes.

We use technology when it provides a distinct advantage. We have so far used hybrid wired and wireless technology for communication (including telephone and modem, VHF two-way radio and spread spectrum), hybrid grid-solar energy, Intranet and Internet. Currently we are testing the possibility of using World Space radio to network the rural poor of the world. This experiment forms the basis of a proposal to the G8 DOT Force and the UN ICT Task Force. Importantly, in our project the technologies and the knowledge centres are collectively owned by the community and not by an individual or a family. As people are indeed poor, it will not be possible for individual families to afford any of these technologies for a long time to come. The knowledge centres are operated by local volunteers, mostly women, selected by the community. We are looking at possibilities for revenue generation (from those who can afford) and Accenture has shown interest in developing a revenue model for our knowledge centres.



Towards a network for the rural poor of the world

We are aware of projects that have not got off the ground or folded prematurely because of the emphasis placed on technology without a clear understanding of the context and needs of the local communities.

We understand that mere provision of information cannot lead people out of the poverty trap. Access to relevant information is only part of the story. People need to build skills and capacities they could convert into additional income. We take an integrated view of development and are working closely with the biovillage and ecotechnology groups of our Foundation. These groups are working closely with farm families in Pondicherry and Tamil Nadu and have developed many income-generating low-cost technologies, such as mushroom growing, ornamental fish, production of biopesticides, production of high yielding varieties of seeds, converting banana waste into paper and boards, and production of green fodder for cattle. We work closely with self help and microcredit groups in the project villages. In addition, we are entering into partnerships with

Multiple livelihood opportunities

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government departments, schools, libraries and primary health centers in the region as well as with like-minded partners abroad. Some donor agencies such as Hivos have come forward to use our experience as the building block for ICT-related South-South exchange of experiences.

The project team and all of us at the Foundation are happy that this project has won the Motorola Dispatch Solution Gold Award 1999 and the Stockholm Challenge Award 2001 and our colleague Dr Venkatraman Balaji has won the World Technology Award, but our greatest satisfaction comes from the appreciation we continue to receive from the communities we work with.

Poor, but happy!

Before I close

Incidentally, early this year Ms Herfkens sanctioned a substantial budget to IICD for their ICT-based development programmes in eight developing countries in the next five years.

I wish to thank my colleagues, past and present, in Informatics Centre of MSSRF, our Chairman Prof. Swaminathan, the IDRC, Canada, and most importantly the village communities in the Union Territory of Pondicherry, without whom there would have been no project. I am also grateful to Prof. Bruce Alberts, Alfonso Gumucio Dagron, and the numerous media persons who made our project known to the wide world, and to organizations such as One World International and Hivos for their confidence in our commitment.

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